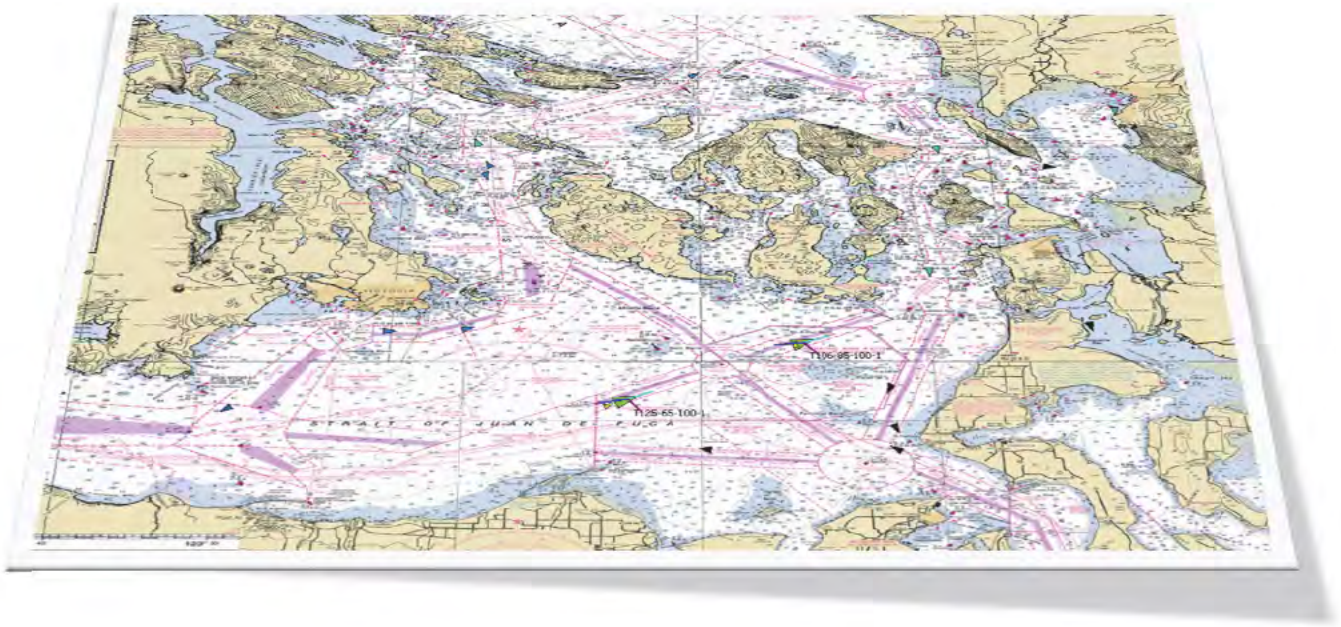
CHAPTER 10

VTRA 2010 FINAL REPORT

Preventing Oil Spills from Large Ships and Barges In Northern Puget Sound & Strait of Juan de Fuca



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10. CONCLUSIONS AND RECOMMENDATIONS

A detailed consideration of traffic levels is particularly important as one moves forward to considering risk and POTENTIAL changes in risk from the commercial projects being proposed for the northern Puget Sound and southern British Columbia over the next decade or so. To put it simply, keeping everything else the same, when traffic increases risk increases, unless mitigated. Further, there is no guarantee that risk increases due to traffic increases can be fully mitigated.

The starting point for the 2010 VTRA analysis is the updated 2005 VTRA model with 2010 VTOSS data. The update of the 2005 VTRA model to using 2010 VTOSS data and the validation of this update with AIS 2010 data, is fully described in detail in [19] and for completeness also summarized in this report. To distinguish the study described herein from the previous 2005 VTRA study conducted from 2006-2008 it is labeled the 2010 VTRA or VTRA 2010.

In the VTRA 2010 study, the VTRA 2010 Steering Committee chose to model only the traffic level impacts of planned expansion and construction projects that were in advanced stages of a permitting process. Each planned project forms a What-If scenario and What-If vessels are added to a maritime simulation of the 2010 Base Case year (Case P). Four What-If scenarios were modeled in the study:

(1) The Gateway bulk carrier terminal (Q)
(2) The Trans-Mountain pipeline expansion (R)
(3) The combination of proposed changes at Delta Port (S)
(4) All three of above scenarios operating at the same time (T)

Following What-If scenario analysis utilizing the VTRA 2010 model, 11 Risk Mitigation Measure (RMM) Scenarios were implemented on top of the VTRA 2010 model in an attempt to mitigate POTENTIAL increases in vessel time exposure, accident frequency and oil loss as evaluated by the VTRA 2010 What-If scenario analyses. Four RMM scenarios were enacted on the 2010 base case year (P), 2 were enacted on the Gateway What-If Scenario (Q) and 5 were enacted on the Combined What-If scenario (T). RMM decisions, however, are not limited to the 11 RMM Scenarios investigated during this study. Moreover, 8 sensitivity analysis scenarios were designed on top of the VTRA 2010 model to evaluate sensitivity of the VTRA 2010 model with respect to historical observed traffic levels. Since the sensitivity analysis scenarios are based on the selection of high and low historical traffic years these analysis scenarios can also serve as bench marks for the What-If scenario and RMM scenario analyses conducted using the VTRA 2010 model.

Following the bench marking/sensitivity analysis it was concluded that POTENTIAL delta changes increases in risk from the base case 2010 year for the What-If Scenario analyses exceed delta changes in risk evaluated for the high-year bench mark/sensitivity scenario analysis. It is therefore concluded that were any of the three What-If Scenario's to come into effect, or a

combination thereof, that POTENTIAL delta changes in risk be deemed significant changes from the base case 2010 year evaluated risk levels. Hence, were any of the three What-If scenarios to come into effect, or any combination thereof, it would only be prudent to consider the implementation of one or more risk mitigation measures to counter those POTENTIAL risk increases.

The challenge of risk management is for it to be location specific, taking into consideration the type and location of traffic and how it changes as a result of proposed traffic increases. The proposed RMM scenarios evaluated herein were in part informed by evaluated changes in risk for the four What-If Scenarios. Comparing evaluated delta change risk reductions for the RMM scenario using the VTRA 2010 model, it was concluded that for 9 out of the 11 RMM scenario's delta change reductions were larger than the delta change reductions evaluated for the low year bench mark/sensitivity scenarios. Hence, it is concluded that for 9 out of these 11 RMM scenarios these risk reductions be deemed significant and be considered POTENTIAL risk mitigation measures for implementation should any of the three What-If Scenario's, or any combination thereof, to come into effect.

One must realize that risk does not necessarily disappear when mitigated locally, but tends to migrate as evidenced by some waterway zones experiencing increases in risk when other waterway zones are targeted for risk reductions. This is in large part a result of a maritime transportation system being a dynamic system, where a small traffic perturbation can precipitate traffic behavior changes in the future. Such migrations are preferably avoided in a sound risk management strategy, but some risk migration may be inevitable. To still achieve risk reduction across the VTRA study area, we believe that the question "which risk mitigation measure should one implement?" is not the right question to ask, but rather one should ask oneself "which portfolio of risk mitigation measures should one implement". A trial 6 RMM portfolio scenario analysis was conducted utilizing the VTRA 2010 model which resulted in risk reduction across virtually all the various waterway zones considered in the VTRA study area. Most importantly, evaluated POTENTIAL accident frequencies after the implementation of the trial RMM portfolio on top of the Combined What-If Scenario (T), that assumes all three expansion scenario are in effect simultaneously, were lower than evaluated Base Case (P) POTENTIAL accident frequencies. Evaluated POTENTIAL oil losses for the Combined What-If Scenario (T), on the other hand, were still evaluated at a higher level than the Base Case 2010 year. This leads us to the conclusion that while evaluated POTENTIAL risk increases as a result of the What-If Scenarios be deemed significant, we do believe that most of those risk increases can be mitigated utilizing a well designed RMM portfolio.

In testament to the Puget Sound Harbor Safety Committee's stated objective of instilling a safety culture within the Puget Sound maritime community, 4 out of the 11 suggested RMM scenario's involved risk mitigation measures that are currently under consideration or have been partially

implemented. The evaluation of these RMM Scenarios in the VTRA 2010 model was enacted on the 2010 Base Case year. Subsequent analyses evaluated delta change reductions in risk for these RMM scenarios that exceed the delta change reduction in risk evaluated for the historical low year bench mark/sensitivity analysis scenario. Hence, even if none of the three individual What-If scenarios come in effect, it is recommended that these risk mitigation measures be considered for across the board implementation in the VTRA study area.

In light of the observations in this VTRA 2010 study, while considering a longer-term view of risk management in the VTRA study area, we close with the observation that there is a serious need for an electronic data source that is cross-boundary (US and Canadian waters) where the vessel type is consistently defined and verified beyond cargo focus vessel or tank focus vessel classifications. VTOSS and AIS are such cross-boundary data sources and could serve this purpose. However without currently possessing a common and consistently recorded vessel identifier or vessel type classification, VTOSS and AIS unfortunately still required vetting at the individual vessel level for the purpose of the analysis presented in this report. Moreover, with the same eye towards risk management analysis it would be equally beneficial if such datasets capture cargo or at a minimum cargo levels (laden, unladen, 50% laden, etc.) and a cargo type. In particular, we would like to specifically call out the need for the electronic recording at a much greater consistency of the barge type and cargo content of tug-tows. Not only would studies like these benefit from the availability of such a data source, but the immediacy of having such information available could also benefit first responders responding to a spill scenario both from a response and a safety to the first responder perspective.

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Appendix: Glossary and List of Acronyms

- Allision–The collision of a vessel with its intended docking berth.
- AIS – Automatic Identification System
- ATB – Articulated Tug Barge
- Ecology – The Washington Department of Ecology's Spill Prevention, Preparedness and Response Program which is the primary state organization with authority and accountability for managing oil and hazardous material spill risk state-wide. Ecology is assisting PSP in conducting the VTRA with its expertise and experience.
- EPA – Environmental Protection Agency.
- MTS – Maritime Transportation System.
- FV – Focus Vessel.
- ITB – Integrated Tug Barge.
- IV – Interacting Vessel.
- MXPS – Marine Exchange Puget Sound.
- NGO – Non-Governmental Organization.
- NPO – Non-Persistent Oil
- Study Area – The Washington waters of Puget Sound east of Cape Flattery, north of Admiralty Inlet and west of Deception Pass, and their approaches.
- GW – George Washington University is the prime subgrant awardee.
- VCU – Virginia Commonwealth University is a sub-awardee to GW.
- GW/VCU – The technical team composed of GW and VCU.
- PO – Persistent Oil.
- PSP – The Puget Sound Partnership is the Washington state agency responsible for developing a Puget Sound Action Agenda, convening a Cross Partnership Oil Spill Work Group and for coordinating work to restore and protect Puget Sound.
- PSHSC – The Puget Sound Harbor Safety Committee.
- VTRA 2010 Steering Committee – A steering committee of stakeholders advising the Puget Sound Partnership and GW/VCU over the course of this study.
- QAPP – Quality Assurance Project Plan
- USCG – US Coast Guard Sector Seattle, District 13.
- VTOSS – Vessel Traffic Operational Support System
- VTRA – Vessel Traffic Risk Assessment
- VTS – Vessel Traffic Service is the real-time marine traffic monitoring system used by the USCG, similar to air traffic control for aircraft.

List of other VTRA meeting attendees

Individuals who attended one or more meetings (alphabetized by organization)

1. Scott McCreery (BP)
2. John Robinson (Cardno-Entrix)
3. Tom Ehrlichman, Barbara Dykes (Center for Salish Community Strategies)
4. Kevin Campion (Deep Green Wilderness)
5. John Kaltenstein (Friends of the Earth)
6. Sam Olson (Friends of the San Juans)
7. David Gray, Eleanor K. N. Kirtley (Glosten Associates)
8. Michael Davies, Bikramjit Kanjilal and Kris Faucett (Kinder Morgan)
9. Gordon Maclean (Marine Exchange)
10. Michael O'Leary (National Wildlife Federation)
11. George Galasso (Olympic Coast National Marine Sanctuary)
12. Dave and Karen Anderson (Orca Network)
13. Arif Ghouse (Port of Seattle)
14. Andreas Udbye (Portland State University)
15. Daryl Williams, Preston Hardison (Tulalip Tribe)
16. JD Ross Leahy (University of Washington -SMEA)
17. Justin Willig (University of New Hampshire graduate)
18. Marc Ashley (USCG Sector Seattle)
19. Todd Malloy